

HYPNUM PLICATULUM IN EASTERN NORTH AMERICA

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Hypnum plicatum (Lindb.) Jaeg. was reported first from North America by Lindberg (1903) under the name *Stereodon plicatulus* Lindb. The specimen on which this record is based came from Lake Lindeman in northern British Columbia where it was collected by R.S. Williams. Lindberg provided figures that point out its distinctions from *H. callichroum* Brid.

Crum and Anderson (1981) noted, among the excluded species of Hypnaceae, the name *H. molluscoides* Kindb., a species described from Newfoundland, but in which the type specimen, characteristic of many of Kindberg's new species described from Canada, is difficult to locate with confidence. Dr. H. Ando (*in litt.*, 1992) has stated that he has seen several specimens from Newfoundland and Labrador that bear locality, dates and collectors cited by Kindberg and labelled as *H. molluscoides* Kindb. These are housed in diverse European herbaria (BM, PC, etc.) All are *H. plicatum*. Thus Ando's (1972) conclusion that *H. molluscoides* is synonymous with *H. plicatum* is confirmed.

Grout (1932) first noted *H. plicatum* from eastern North America under the name *H. subplicatile* (Lindb.) Limpr. His report was very tentative and based on a specimen from Seal Island, Labrador described as *Hypnum implexum* Ren. & Card. that he noted to match the specimens of the Lake Lindeman plants reported by Lindberg. Ando (*in litt.*, 1992) noted that he had examined this specimen and concluded it to be identical to *H. plicatum*. The report of Tuomikoski *et al.* (1973) of *H. plicatum* from Newfoundland carried the same uncertainty.

It can be noted here that there is unquestionable *H. plicatum* in eastern North America. It is best represented in the Gulf of St. Lawrence region, and is especially frequent on calcareous substrata in the Mingan Islands, Quebec, and relatively frequent in Nova Scotia, especially on the south shore of the Bay of Fundy on North Mountain, and in the Cape Breton Highlands.

Hypnum plicatum belongs to the troublesome section *Hamulosa* B.S.G. as emended by Ando (1973b). Besides *H. hamulosum* B.S.G. as the type of the section, it includes *H. plicatum*, *H. callichroum*, *H. subimponens* Lesq., *H. emodi-fertile* Ando, *H. aemulans* Breidl. *in* Limpr., and possibly an undescribed species from arctic and subarctic regions.

Although *H. plicatum* shows some variability in growth form and color, related in large part to insolation and humidity of its environment, it usually can be distinguished from related species. Persson (1947) pointed out the main distinguishing characters. From *H. callichroum* and *H. hamulosum* it can be distinguished by its nearly auriculate leaves that possess a small alar cluster of cells displaced well away from the auriculate area and close to the stem. In *H. callichroum*, where an auriculate portion is present, it is formed of a well-differentiated cluster of thinner-walled and enlarged cells. Ando (*in litt.*, 1992) noted that the sporangium is plicate when dry, a feature not shared by related species. Neither *H. hamulosum* nor *H.*

subimponens exhibits the auriculate region, but the leaf margins curve gradually to the insertion. *Hypnum emodi-fertile*, among other features, possesses rather short acuminate leaves, and the alar cells form a conspicuous group (Ando, 1973a). *Hypnum aemulans*, according to Ando (1972), shows well-developed hyaline alar cells and thus resembles *H. callichroum* rather than *H. plicatulum*.

Although Ando (1972) shows a broken distribution for *H. plicatulum* in North America, it appears that the species ranges across the boreal portion of Canada. The unsatisfactory bryological exploration of much of that region probably explains the gap in distribution (Fig. 1).

Hypnum fertile Sendtn. has been sometimes mistaken in North America for *H. plicatulum*. It is possible that I have perpetuated this error in my M.A. thesis (Schofield, 1956), where I failed to recognize *H. plicatulum* as a distinct species and combined it with *H. callichroum*. Furthermore, I confused *H. plicatulum* specimens of eastern North America with *H. fertile*. As Ando (1973) has noted, the stems of section *Fertilia* are not strictly hyalodermous, although the epidermal cells are sometimes somewhat thin-walled on the outer surfaces. Stem leaves in *Fertilia* have thin-walled hyaline cells in an excavate group toward the leaf base. This latter character is absent in the section *Hamulosa*. Furthermore, *H. fertile*, an autoicous species, usually has sporophytes, while the *Hamulosa* frequently lack them. The North American range of *H. fertile* is unsatisfactorily understood, but it is clearly confined to eastern North America, and the range overlaps with *H. plicatulum* in Nova Scotia, at least.

Since a complete description is difficult to find, one is provided, based on North American specimens:

Plants soft, forming creeping mats or turfs of suberect interwoven shoots, with stems 2–5 cm long and bearing regular or irregular branches 0.2–0.5 cm long, yellowish- to golden-green, when best developed, closely and regularly pinnate. Stems green to yellowish or occasionally with a tinge of brown, cortical cells hyalodermous, inner cells incrassate; pseudoparaphyllia foliose, often forked, with attenuate uniseriate tips on the lobes. Stem leaves curved to falcate-secund, 1.0–1.5 mm long, ovate lanceolate to narrowly triangular, inserted with an auriculate base and curving gradually to a long attenuate apex; margin often toothed on auriculate portion, entire or toothed in upper portion, plane; costa short and double or inconspicuous; cells linear flexuose, 50(–60)–70(–80) μm long; alar cells 5–6, angular, often colored, triangular to rectangular or rhomboidal, 6–15 μm long, thick-walled except for the outermost and lowermost one, abruptly different from the stem cortical cells and rest of the leaf cells, sometimes reduced or absent. Setae red, 2.0–2.3 cm long, smooth; sporangia 1.5–2.0 mm long, curved, somewhat contracted below mouth and plicate when dry; operculum conic, 0.5 mm long; exostome teeth yellow to brownish.

Habitat—Growing up tree bases, on logs, over humus on cliff shelves or on humus over boulders, forest floor to bog margins, most frequently in somewhat shaded sites, especially on slopes below cliffs.

Distribution—A predominantly boreal species: in eastern North America known from Nova Scotia, New Brunswick, Newfoundland, Labrador, Quebec, Baffin Island, and Ontario. Apparently rare in the Arctic Archipelago, also in western North America: Manitoba, MacKenzie District, N.W.T., Yukon, Alaska, and northern British Columbia.



FIG. 1. Canadian and Alaskan distribution of *Hypnum plicatulum*.

(UBC). Newfoundland: Benoit's River, Humber Arm, Humber, *Tuomikoski 5371* (CANM); Flower's Cove, St. Barbe, *Tuomikoski 4246* (CANM); Gros Morne National Park, Western Brook Pond, *Vitt 31344* (ALTA). Northwest Territories: Baffin Is., Cumberland Sound, vicinity of Pangnirtung, *Wynne-Edwards 28* (CANM). Nova Scotia: Pictou Co., Brookland, *Schofield, Belland & Weber 89746* (UBC);

Kings Co., Cambridge, *Schofield* 2785 (UBC); Lunenburg Co., Deep Cove, *Ireland* 17669 (UBC); Digby Co., Long Island, Flower's Cove, *Schofield & Schofield* 95539 (UBC). Ontario: Lake Nipigon, SW corner of Ellis Island, *Garton* 21930 (CANM). Quebec: Cap Chat, *Fabius* 4990 (CANM); Ungava Bay, Fort Chimo, *Lepage* 13689 (UBC); Great Whale River, *Tuomikoski* 4901 (CANM); Lac Guillaume-Delisle, Richmond Gulf, *Ireland* 21427 (CANM); Mingan Archipelago, Grosse Île au Marteau, *Hedderston* 7684 (UBC), Île du Havre, *Schofield, Belland & Hedderston* 93459 (UBC), Île de Fantôme, *Schofield, Belland & Hedderston* 94140 (UBC), Île Ste. Geneviève, *Schofield, Belland & Hedderston* 94337 (UBC).

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